REPORT

OF THE

STATE DEPARTMENT

OF

FORESTRY

UNIVERSITY OF MARYLAND

FOR

FISCAL YEAR 1930

OCTOBER 1, 1929, TO SEPTEMBER 30, 1930

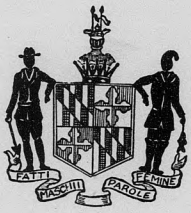

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TABLE OF CONTENTS

	Page
Introduction	7
Assistance to Woodland Owners	8
Reforestation	8
By Selective Cutting	8
By Planting	9
State Forest Nursery	10
State Forests	12
Shade-Tree Activity	14
Investigations	15
Nursery Practice	15
Treatment of Seed Prior to Seeding	15
Treatment of Seed Beds	16
Control of White Grubs in Seed Beds	19
Fire-Damage Study	19
Education	21
Lectures	21
Exhibits	21
Publications	21
Forestry Tours	22
Fire-Poster Contest	22
Forest Protection	22
Organization	23
Cooperation	26
Federal Government	26
Adjoining States	27
The Counties	28
Frederick City	28
Volunteer Fire Companies	29
Industries and Institutions	30
Other Agencies	30
Fire Prevention	32
Fire-Warning Posters	32
Railroad Fire Hazards	33
Claim Collection	34
Law Enforcement	34
Other Agencies	35
Fire Preparedness	35
Fire-Detection System	35
Telephone Connections	37
Forest-Fire Tools	38
Forest Wardens' Conferences	40
Other Improvements	40
Forest Fires in 1930	41
Tables and Diagrams	45
Financial Statement	52

APPENDIX

Page

Woodland Examinations ---------- 53
Summary by Counties ---------- 54

Markings ---------- 54
Summary by Counties ---------- 55

Estimates ---------- 55
Summary by Counties ---------- 55

Planting Plans ---------- 55
Summary by Counties ---------- 56

Lectures ---------- 56

Prize Poster ---------- 59

LIST OF ILLUSTRATIONS

		Page
Plate I.	Frontispiece—Stoney Forest Lookout Tower	6
Plate II.	Figure 1.—Taking Care of Wires Without Serious Injury to Roadside Trees	11
	Figure 2.—Neatly Trimmed Trees Under Pole Line	11
Plate III.	Figure 1.—Growing Trees for Roadside Planting	17
	Figure 2.—Planting Roadside Trees	17
Plate IV.	Figure 1.—A Typical Scene on Savage River State Forest	31
	Figure 2.—Camping is Popular on Swallow Falls State Forest	31
Plate V.	Figure 1.—A Promising Young Pine Forest Destroyed by Fire	39
	Figure 2.—Unburned Pine Stand	39

STONEY FOREST LOOKOUT TOWER, 80 FEET HIGH, BUILT IN COOPERATION WITH THE COMMISSIONERS OF HARFORD COUNTY AND S. D. PEVERLEY.

INTRODUCTION

THE OUTSTANDING FEATURE of the year, 1930, was the severest fire season in the history of the Forestry Department, covering a period of 24 years. Instead of the normal spring fire season beginning about April 1 and closing about June 1, the fire season continued with alarming conditions all through the summer until late autumn, presenting a problem never before encountered. There were three times as many fires as in any previous year of record and the fires, due to the extremely dry conditions, were more difficult to control. It was a severe trial of the fire protective organization which had been built up through the years with a system of fire lookout towers, fire guards and forest wardens equipped with improved fire fighting tools, assisted by volunteer fire companies. The fire fighters worked day and night under the most trying conditions, never letting up on a fire until it was out. The losses in forest property were heavy, but only a fraction of what they would undoubtedly have been except for the good work of the fire fighters. The 1930 season has demonstrated the real need of additional forces to supplement the regular organization in times of emergency such as this.

The purchase of land for State forests under the appropriation made available this year has proceeded very satisfactorily. New purchase units have been established and a definite policy of land acquisition mapped out to increase the area of State forests so that eventually they will embrace 200,000 acres. Large areas of suitable land are offered at very low prices, presenting an opportunity that should be acted upon without undue delay.

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ASSISTANCE TO WOODLAND OWNERS

The market for forest products has been influenced adversely by the declining market for other products. Consequently, there has been a very limited sale of timber and wood and therefore a limited opportunity to help farmers and others to realize from their forest properties. Nevertheless, many calls have come in for assistance, and during the year 42 woodland tracts in 16 different counties of the State, comprising 3,199 acres, have been examined by the Foresters and plans of management proposed. In addition to this, on 11 tracts of 818 acres, in seven different counties, a definite plan for a selective cutting was carried out by marking, estimating, and appraising the value of the timber and helping the owners find a market. On four other tracts of 174 acres the owners were given a careful estimate of the timber, and a plan of management.

The Department feels that this work, in addition to being of real practical value to the owners of woodlands, is the most effective way of bringing about good, sound forestry practice, each well-managed woodland serving as a good example of proper forest management. The reader is referred to the appendix of this report for a detailed summary of the work accomplished.

REFORESTATION

By Selective Cutting

The natural conditions favoring tree growth are so favorable in Maryland that timber growing is simple. There is a wide range of native tree species, a large number of them of high commercial value. The soil and climatic conditions are excellent. The two greatest obstacles are forest fires and lack of a market for the lower-grade materials, which as the result of injurious cutting in the past now constitute such a large part of the forest growth.

There has been a marked improvement in fire control during the past few years. This is due in part to the increasing interest in forest protection on the part of woodland owners, but to an even greater extent to the protection system of forest

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wardens, lookout towers, improved fire fighting tools, and other agencies employed by the Forestry Department in controlling fires. The extremely dry year of 1930 was the worst fire year since fire records have been kept, beginning 24 years ago. Yet in spite of the fact that there were over 2,000 fires, each very difficult to control, the size of the average fire was no greater than other years.

The best forest management is only possible where there is a market for all products of the forest—the low-grade cull material as well as the high-grade timber. Permanent improvement is only possible where the poor, defective material is removed to make room for the better growth, or at least when the more valuable species are favored at the expense of the poorer kinds.

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In its woodland work, whenever the Forestry Department is called upon to assist private owners, special emphasis is placed upon the importance of so conducting cutting operations as to leave the woods in good condition for a new timber crop. This is accomplished in hardwood stands by selective cutting, in which the defective trees and those of poor species are cut, along with the good timber, in order to give the new growth a fair chance. In the case of pine forests, particularly the loblolly pine, the leaving of three or four seed trees to the acre is recommended to insure reseeding of the desirable species after practically clear cutting. Excellent reforesting of pine has been secured in this way.

By Planting

There are scattered areas of so-called submarginal land that have ceased to be profitable for field crops but which are suitable for growing timber. This use of land for a timber crop, instead of its lying idle, is fully justified economically on the principle that all land should be devoted to its highest use. It is estimated that there are about 180,000 acres of such idle land in the State and that most of it should be planted in forest trees to bring about its most productive use. A proper spacing of 6 x 6 feet requires 1,200 trees to plant an acre. The Forestry Department furnishes at cost trees suitable for forest planting from its Forest Nursery at College Park, and will

on request examine lands to determine their suitability for planting and the kinds of trees best suited for the site. A loblolly pine plantation for which the trees cost $2.50 per thousand and the labor of planting from $2 to $4 makes an acre cost of from $5 to $7 for the plantation, using 1,200 trees per acre.

Many forest plantings have been made in the past few years, most of them being experimental on a small acreage. The success of nearly all of these plantings has demonstrated their practicability and the interest in forest planting is constantly increasing, as attested by the distribution of over 425,000 trees for forest and windbreak planting during the year—a 30 per cent increase over the previous year.

State Forest Nursery

The purpose of the Forest Nursery is to grow and distribute at low cost trees suitable for forest, windbreak, and roadside planting to encourage tree planting generally. Only standard kinds of proven merit are distributed, but a sufficient variety of species is grown to meet any requisite of soil or climate in the State.

During the year 426,500 trees were distributed from the Nursery for forest and windbreak planting. Of this number over 92 per cent were for forest planting. For this purpose, small trees 5 to 18 inches in height are almost universally used. Seedlings are suitable for open ground, but transplanted stock is best on weedy or brushy ground.

For windbreak planting larger transplanted stock is generally used, from 18 inches to 3 feet, for which only a small quantity is grown, and its use is limited to actual windbreak planting.

Planting trees along highways, even though it be primarily for the improvement of private property, is also doing a public service that should be encouraged. To this end the Forestry Department grows and distributes at cost larger deciduous trees, 7-15 feet in height, suitable for roadside planting.

FIG. I—TAKING CARE OF TELEPHONE WIRES WITHOUT SERIOUS INJURY TO LARGE ROADSIDE TREES.

FIG. 2—NEATLY TRIMMED TREES UNDER POLE LINE ALONG HIGHWAY.

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During the past year 5,125 trees were distributed for roadside planting, enough to plant a double row of trees along 25 miles of highway.

The very dry summer of this last year, 1930, checked the growth of trees in that part of the Nursery not covered by the irrigating system. The forest planting stock, all of which was under the irrigation system and frequently watered, made a normal growth.

An inventory of stock at the Nursery shows a 25 per cent increase over that of the previous year, which corresponds with the normal increase in the yearly demand for the past few years.

Planting stock available at the Nursery for planting next spring is estimated at 600,000 trees for forest and windbreak planting and 10,000 trees for roadside planting.

STATE FORESTS

		Acres	*Acres*
Garrett County			
Swallow Falls Unit		4,034	
Skipnish	916		
Brier Ridge	996		
Herrington Manor	713		
Kindness	206		
Piney Run	1,203		
Auxiliary State Forest			600
Savage River Unit		16,178	
Bond	9,559		
Dimeling and Bloom	6,619		
Washington County			
Fort Frederick Forest		189	
Baltimore-Howard Counties			
Patapsco Forest		1,116	
Auxiliary State Forest			1,200
Talbot County			
Seth Demonstration Forest		65	
Charles County			
Doncaster Unit		1,157	
		22,739	1,800

The $50,000 appropriation for the purchase of State forests, made by the Legislature of 1929, became available during the year and an active purchase program has been under way, some of the preliminary work having been initiated in 1929 before the appropriation became available.

Three tracts, totalling 12,312 acres, were purchased during the year after a careful examination to determine the suitability for State forests and surveys had been made to determine the acreage and to mark the lines. Two of the tracts, containing 11,155 acres, were adjacent to the Savage River Forest in Garrett County, bringing that forest up to 16,178 acres. The other tract of 1,157 acres is in Charles County and is designated the Doncaster Forest.

Other tracts have been examined, options taken, and their purchase will be completed during the coming year.

The regular procedure is to examine all tracts offered at a fair price, if adjacent to existing State forests, or if in new areas suitable for State forests, where it appears that a unit of at least 5,000 acres can be secured in a reasonable time at a fair price. The only exception to this rule would be a few smaller purchase units to be operated as demonstration forests in Southern Maryland, the Eastern Shore, and the Piedmont plateau. If upon examination the lands are found suitable for State forests and the price per acre acceptable, an option is taken for a length of time sufficient to make surveys and examine title. All titles are subject to the approval of the Attorney-General and all purchases are subject to the approval of the Board of Regents and the Board of Public Works.

The purpose of State forests is three-fold:

1. Non-agricultural land, cheap in price, is acquired and placed under management primarily for timber growing. Protection from fire is the chief concern, but open, unstocked areas are planted in trees and means taken to place the lands under their greatest productive use. In this way the State is building up a reserve timber supply.

2. A large part of the State forests lies on the watersheds of important rivers and streams, the waters of which serve for domestic use and for power purposes. A protection forest

cover is essential for water conservation in regulating stream flow, preventing erosion, and preserving the purity of the water. The State forest insures the best watershed protection.

3. The recreational value of the State forests is being realized to an increasing extent for camping, hunting, and fishing. Many thousands of people use the State forests every year for these purposes—a use that is being encouraged as far as facilities can be provided.

SHADE-TREE ACTIVITY

This Department is called on more and more each year for advice in shade-tree problems. The inquiries cover all phases of tree work—the best species to plant, how to care for the trees, and the identification of leaves, fruits, and twigs; and during the summer months a large number of inquiries regarding shade-tree insects and diseases are received. This is a healthy sign, for it shows that people are becoming more "tree-minded" and appreciate the value of trees for shade and ornament.

The Roadside Tree Law of 1914 places the care and protection of all trees within the right-of-way of the public roads and between the curb and property line of incorporated towns under the Forestry Department.

Special forest wardens, known as tree wardens, are assigned by the Department to supervise the trimming of trees along the public highways by the pole-line companies, to give clearance to their wires. The cost of the supervision is charged to the company or individual having the work done. The tree wardens, however, are employees of the State and have no connection with the pole-line companies—in this way, it is believed, they can best safeguard the public interest in the trees.

It is a very difficult problem to maintain the existing trees along the highways in an attractive condition and at the same time give necessary clearance to the overhead wires. There must be a compromise between what is best for the trees and the legitimate requirements of the pole-line companies. Many thousands of trees have been saved under the operation of this

law. During the past year, 37 forest wardens were assigned to tree work and supervised the trimming of approximately 30,000 trees.

The right of the State to supervise the trees in incorporated towns was contested during the past year by the Town of Elkton, and it was necessary for the Department to procure an injunction ordering the town officials to refrain from further cutting of trees until a permit was secured. The case was tried before the Circuit Court in Elkton, and the law upheld.

Three towns and one State institution accepted the offer of the Department to examine and report on the care of their shade trees. These were Crumpton, Elkton, and Bel Air, and the Montrose School for Girls.

Nothing improves the appearance and comfort of the highway more than well-selected, well-spaced shade trees. The public is awakening to the fact that there are many miles of improved highways that can be beautified by tree planting, and the Department has cooperated with them by offering free trees, if certain specifications can be met. During the past year 10 of these plantings, using 1,124 trees, were made.

INVESTIGATIONS

Nursery Practice

Treatment of Seed Prior to Seeding.

Good seed years in forest trees for most species occur at intervals of 3 to 5 years, so that it is often necessary to store a 3 or 4 years' supply. Tree seeds lose their viability or germinating per cent year by year, some species more rapidly than others. It has been found that the conditions under which it is stored and its treatment just prior to planting are important factors in securing good germination. An experiment tried about two years ago with different tree seed 3 to 4 years old, by which they were mixed with moist sand and put in cold storage at a uniform temperature of 34 degrees for six weeks just prior to seeding, gave satisfactory germination, whereas the same lots of seed untreated showed very poor, irregular germination. Later experiments in which old seed mixed with

moist sand and stored in a tight but unheated building gave equally good results and this method has been adopted as regular practice.

The fall of 1927 was an exceptionally good seed year for loblolly pine on the Eastern Shore of Maryland. The Department collected 600 bushels of cones. The cones were dried in the seed house at the Nursery and produced 700 lbs. of seed. This seed has been stored in large sealed cans in a cellar and a quantity of it used each spring, including the 1930 seeding; it is expected to use this same seed for another year at least, when another fair seed crop is predicted.

The usual practice is to take from storage about January 1 the amount required for the next spring's sowing. This is mixed with 2 parts of moist sand, put in closed containers, and subjected to average outdoor temperatures, but in a tight building where the extremes of temperature are avoided. The results each year, including this past spring, from the use of seed now four years old have been uniformly good. The sowing of this moist stored seed in early April results in quicker and more uniform germination than with dry fresh seed.

Treatment of Seed Beds to Prevent "Damping Off" and for Weed Control.

A fungus disease working in the soil, called "damping off," is a serious trouble in most nurseries and is particularly destructive to the tender seedlings of red pine, white pine, Scotch pine, and the spruces. Over a period of seven years various chemical treatments were tried with varying results. Formaldehyde at the rate of ½ oz. per sq. ft. of seed bed was used extensively for four years. This proved effective in controlling "damping off," but had little if any effect in weed control. The treatment, however, was expensive. Furthermore, seeding was delayed at least two weeks due to the fact that the seed beds had first to be prepared and then treated 10 days prior to seeding.

Three years ago, in cooperation with the Division of Forest Pathology in the U. S. Department of Agriculture, experimental plots were laid out, each treated with a different chemical, and by means of check plots and careful records a fair com-

FIG. 1—GROWING TREES FOR ROADSIDE PLANTING AT THE STATE FORESTRY NURSERY.

FIG. 2—PLANTING ROADSIDE TREES AT LAYTONSVILLE, MONTGOMERY COUNTY.

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parison of effectiveness of chemical treatment was obtained. The results are given in the following table. It should be noted, however, that the observations were for a single season and that variations in soils might give different results.

CHEMICAL TREATMENT OF SEED BEDS FOR "DAMPING OFF" AND WEED CONTROL

Each Plot 4 x 4 ft., or 16 sq. ft.

TREATMENT

1928	Formaldehyde CH_2O ½ oz. per sq. ft.		Aluminum Sulphate $Al_2(SO_4)_2$ 5/16 oz. per sq. ft.		Aluminum Sulphate $Al_2(SO_4)_2$ ½ oz. per sq. ft.		Sulphuric Acid H_2SO_4 3/16 oz. per sq. ft.		None	
	Per cent Damped	Number Weeds	Per cent Damped	Number Weeds	Per cent Damped	Number Weeds	Per cent Damped	Number Weeds	Per cent Damped	Number Weeds
White Pine	6.7	260	26.3	649	14.1	375	23.5	139	18.9	1044
Norway Spruce	1.8	590	7.4	493	8.9	262	9.4	306	7.4	805
Shortleaf Pine	13.5	424	22.6	534	17.3	537	15.0	145	20.9	776
White Spruce	5.2	751	12.0	907	16.6	590	17.4	271	8.0	757
Douglas Fir	11.4	631	11.8	223	12.9	120	18.6	57	15.8	607
Red Pine	15.9	504	21.3	389	20.4	297	19.6	212	40.7	810
Total per cent	54.5	.....	101.4	.....	90.2	.....	103.5	.....	111.7	.....
Total number	.....	3160	.....	3195	.....	2181	.....	1130	.....	4799
Rank	1	3	3	4	2	2	4	1	5	5
Arbor Vitae	.8	529	.....	.....	.....	.....	.....	.....	.....	.....
European Larch	.....	.....	10.4	298	10.3	451	.....	.....	.....	.....
Scotch Pine	5.5	727	.....	.....	.....	.....	.....	.....	.....	.....

Formaldehyde was the most effective in controlling "Damping Off." Sulphuric acid was the most effective in weed control, and aluminum sulphate ranked second in both control of "Damping Off" and of weeds.

In 1929 sulphuric acid was the principal chemical used, but with only partial success.

In the spring of 1930 steam sterilization of seed beds was tried out on a large scale, applying the treatment to 10,000 sq. ft. of seed beds with sufficient untreated areas to serve as checks. Steam at 25 to 30 lbs. pressure was applied from a steam boiler to the beds, using an inverted pan 4 x 12 ft., and maintaining the pressure until the soil temperature reached about 175° F., 4 inches below the surface. This required from 25 to 30 minutes.

Steam sterilization under the method used was eminently successful. It not only prevented "damping off" but reduced the cost of weeding 75 per cent, this alone paying for the cost of treatment. It apparently gave quicker and more uniform germination of seed and better stock at the end of the season.

Control of White Grubs in Seed Beds.

During the past four years white grubs, the larvae of May beetles, have been very destructive to young seedlings by eating away roots and killing the seedlings. In the spring of 1930 five seed beds, each 100 feet long, were treated with arsenate of lead at the rate of 3 lbs. per sq. ft. The arsenate was worked into the soil to a depth of 3 inches just prior to seeding. Adjacent beds were left untreated as a check.

There was no grub injury to the treated beds during the season and but little on the untreated beds, so that the effectiveness of the treatment was not conclusive. The seedlings on the treated beds soon after germination showed a browning of the tips of the needles, which became more pronounced as the season advanced. By the end of the season the lead poisoning of the seedlings caused the browning of the tips of nearly all the needles and gave a distinct brown cast to the beds as contrasted with the healthy green color of the adjacent untreated beds. In addition, the untreated beds produced larger and stockier seedlings. It is quite possible that a lighter application of arsenate might be effective in grub control and not injure the seedlings to any considerable extent.

Fire Damage Study

The Legislature of 1924 enacted what is known as the Railroad Safety Strip Law which requires the railroad companies to clear annually the inflammable material on the surface of a strip 100 feet wide, measured from the outer rail, wherever the Forestry Department notifies them that a forest fire hazard exists. This is done by annual burning.

In 1925 the Forestry Department, in order to determine the effect upon the forest of annual burning, established 57 pairs of plots, each 100 feet by 50, one plot on the area to be burned over each year while the companion plot of equal size and char-

acter was laid off back of the strip and not burned, to serve as a check. All trees down to one-half inch in diameter breast high were measured and recorded. Following the establishment of the plots the safety strips were burned over and have been burned each year since, as determined by the annual inspections. The plan is to maintain these plots for 20 years, measuring them every five years to determine increase in volume of growth and effect of burning. During the past summer the first 5-year remeasurement was made and a careful check-up made in each set of plots.

This study has not been under way long enough to give very conclusive results and is to be continued. It does show, however, certain trends that are significant, of which a few are noted:

1. Averaging all plots burned annually with those not burned, the latter showed a 13.9 per cent increase in volume over the former. It should be noted that only a light burning occurs since only one year's leaf fall is present.

2. Young stands suffer more from fires than older stands.

3. Pine stands are damaged by fire to the greatest extent, oak the least. Exception should be noted in the case of old stands of loblolly pine with thick bark, which is very fire resistant.

4. The relative fire damage as shown by the plots, which are located in different parts of the State, is greatest in Southern Maryland, followed closely by the Eastern Shore Section. Northern Maryland is next, followed by Western Maryland, Central Maryland being the lowest.

5. There is marked soil deterioration in the plots annually burned.

6. As practically all young growth is killed each year by burning, reproduction of the forest is prevented on burned areas.

EDUCATION

A large part of the work of the Forestry Department is in the educational field. The scientific staff consists of seven technically trained men of wide experience, four of them specialists in different fields of forestry work and three field men engaged in general forest activities. The Department is prepared to give advice and render assistance in all matters involving forestry or shade-tree problems. This advice and assistance is sought to an increasing extent year by year.

In addition to the very large number of inquiries that were handled during the year by correspondence and office visits, certain definite education projects were conducted, of which the following are noted:

Lectures.

The State Forester, who under the Forest Laws is also head of the Department of Forestry in the University of Maryland, gives a course of lectures on Farm Forestry open to students in the Junior or Senior years of the Agricultural School at College Park. In addition, the State Forester and members of his staff gave during the year 121 lectures, 78 of which were illustrated. These were under the auspices of schools, colleges, Parent-Teacher Associations and other civic associations. A detailed list of these lectures is to be found in the appendix of this report.

Exhibits.

A special exhibit was prepared and shown at the Frederick County Fair, while regular exhibit material was used in several other places. The Department has standard crated exhibits which it loans to schools and other organizations for educational purposes.

Publications.

A 75-page bulletin entitled "Sweet Gum in Maryland," by Fred B. Trenk, Assistant Forester, and a leaflet "It Pays to be Careful" were published. The sweet gum bulletin contains new material worked up during three field seasons and is designed

to give full information as to the growth and uses of this important species. The leaflet "It Pays to be Careful" deals with the forest fire problem and is for general distribution in our fire preventive campaign. A number of other pamphlets and leaflets previously published were revised and reprinted, the earlier editions having been exhausted.

Forestry Tours.

The Forestry Department in cooperation with the Maryland Forestry Association conducted a tour of the Eastern Shore in the Loblolly Pine belt, for members of the Association and their friends. In addition to inspection of plantations, managed forests of loblolly pine, and sawmills, other interesting places were visited, including the St. Paul oaks near Tolchester, the famous Wye Oak, Wye House, Hope House, where Mrs. W. J. Starr has established a fine arboretum of native and exotic trees, and Friends' Meeting House at Easton, the oldest frame church in the United States, standing as originally built and, in large part, of the original materials.

Fire Poster Contest.

The Boy Scouts of the State participated in a poster contest conducted by the Forestry Department, in cooperation with the American Forestry Association. The prize was a large plaque to be held for the year by the Troop of which the Scout is a member, and if won by the same Troop three years in succession, it becomes the permanent property of the Troop. The Scout who submits the winning poster is awarded a medal, and the winner for 1930 was Scout George B. Keester, of Troop 334, Annapolis, Maryland. A copy of the winning poster is to be found in the appendix.

FOREST PROTECTION

Forest protection has constituted one of the major activities of the State Department of Forestry from the beginning of State Forestry work in 1906. Forest management and the successful production of forest products entail forest protection as a primary requisite. Not only do forest fires prove an economic loss to the people of Maryland through depletion of

timber resources, but when the forest cover burns other major losses occur. Destruction of the forest cover is an important factor in the pollution and reduction of community water supplies. Navigation is hampered through washing of silt and debris into harbors and stream channels. Recreational values are destroyed through the killing of wild life, game-birds, and fish. Soil values are reduced through the burning of its vegetable content. The purchasing power of the tourist and new resident is lowered through decreased aesthetic appeal. Forest fire destruction vitally affects the economic structure of our communities. It is a problem which deserves increasing attention by Maryland citizens.

The development of the forest protection organization has progressed slowly, due to small appropriations for the purpose and the failure of the public to appreciate the seriousness of the problem. The Department has struggled desperately to change the ever increasing tendency of forest fires to sweep the forest areas of the State. This effort directed largely along cooperative lines has succeeded to a large measure, but very much more remains to be done before forest protection can be classified as adequate. The organization has proven capable of establishing very enviable records in forest fire control during favorable years, but with the arrival of extraordinary fire conditions, such as existed throughout 1930, it has been utterly impossible to provide an efficient fire fighting force capable of handling the situation.

The Organization

During the first 18 years of the work of the Department, the development of the fire control organization was very gradual and was greatly handicapped, due to insufficient funds. The entire responsibility for its development devolved upon one official, an Assistant Forester, who found it a large task to cover even a portion of the entire State adequately, seeking and obtaining responsible men, training them, and properly equipping them for forest fire control. However, the number of forest wardens thus selected and commissioned gradually increased from 57 in 1907 to about 400 in 1927. These men, commissioned by the Governor and empowered

to enforce the forest laws and to suppress forest fires, are the real strength of the organization. They are non-salaried officials with a high sense of public service and moral worth.

In addition to the Assistant Forester who directs the fire control activities, there now are three full-time, technically trained district foresters, in charge of three sections of the State. Cumberland is the headquarters for District I, consisting of Garrett, Allegany, Washington, and Frederick Counties. The headquarters for District II, consisting of the remaining counties on the Western Shore, is at Upper Marlboro, although it is to be transferred to Laurel early in 1931. District III, consisting of the nine Eastern Shore counties, has its headquarters at Salisbury. The employment of the district foresters in the fall of 1927 was an important advancement in the development of the organization, enabling a more thorough study and analysis of the fire control problem in the various counties, and the selection and training of additional forest wardens.

Working on a part-time basis, under the direction of the district foresters, the Department has employed four district forest wardens for supervising, aiding, and directing the work of the forest wardens. These district officials have been engaged in areas where particularly difficult fire problems are known to exist. The activity of these men has been confined to (1) Garrett County, (2) Frederick and eastern Washington Counties, (3) Southern Maryland, and (4) Cecil County. The employment of district forest wardens was first authorized in 1924, and where not assigned too large territories, these officials have proven very effective. These men are usually chosen because of long experience and special ability in forest fire control. They are practical fire fighters who are highly capable of training new forest wardens, organizing special fire fighting crews, exerting special fire prevention effort, and taking immediate charge of all serious situations within their fire control units. They are directly responsible for investigation of law violations, collection of fire suppression claims, and prosecution of law offenders, in addition to maintenance and repair of fire fighting tools and the supervision of lookout tower activity. The district foresters are greatly in need of

more of these practical field lieutenants for increasing the efficiency within their districts.

During 1930, the number of forest wardens in the State reached about 650, the numerical increase not being as great as in immediately preceding years, probably due to the close attention that officials had to give to fire control rather than in seeking additional wardens. Loyal to their oath of office, these self-sacrificing public benefactors performed unflinching service throughout 1930, in controlling fires during the driest and most difficult year the Forestry Department has ever known. Side by side with the forest wardens labored a force of 1,500 registered forest fire crew men. The registered crew plan was inaugurated in 1923 and has proven a decided aid to organized forest fire control. Under the plan each forest warden is authorized to contract for the services of five to twelve men in his locality to serve on any fire in his district. Every effort is made to limit the membership of the crews to reliable and highly respected citizens who are given special instruction and training in forest fire control. In consideration of their agreement to serve whenever called and in recognition of their special ability, these men receive a higher rate of pay than ordinary labor. This system has helped materially in increasing the efficiency of fire fighting forces.

Besides the district foresters and district forest wardens, the State Department of Forestry employed 13 lookout-watchmen to maintain a constant vigilance for fire at the forest fire towers located throughout the State. These men were given part-time employment during periods of fire hazard. Working closely under the direction of the lookout stations, nine forest guards proved of great value in investigating promptly all questionable smokes located by the towers. The practice of using forest guards was first tried out in 1925 and proved so effective that others have been added as funds became available. The lookout-watchmen frequently have much difficulty in determining the source of a smoke, and if forest wardens are slightly delayed in reaching the scene, the smoke may develop into a threatening blaze before control forces can mobilize. The forest guard, because of his constant readiness for action and quickly moving automobile, can fre-

quently reach the scene of danger in short time, promptly subduing the blaze, or at least hindering its advance until the forest warden arrives. Oftentimes the forest guards are called upon to investigate burning operations or camp-fires and are instrumental in preventing the escape of many careless fires. Indeed, these employees are doing much in carrying the lesson of fire prevention to careless individuals at the very moment of omission. Additional forest guards are necessary in order to handle adequately the ever-increasing number of fires.

While the State Forester has general supervisory authority in the handling of the fire control problem, the main responsibility for functioning of the organization rests upon the Assistant Forester, in charge of forest protection, the three district foresters, and four district forest wardens. The real job of forest fire suppression is performed by 13 lookout-watchmen, nine forest guards, 650 forest wardens, and 1,500 registered crew men.

Cooperation

The State Department of Forestry operates on the theory that the owners of forest land have a responsibility, equal with that of the State, for its protection. Consequently efforts are made to encourage landowners and civic organizations to participate actively in the protection of privately owned timberlands. Many agencies are thus cooperating closely with the Department of Forestry in meeting the problem of forest protection.

Federal Government.

The Clarke-McNary Law of 1924 placed upon the United States Forest Service the responsibility of participating in the forest protection program of the various states. Federal regulations require that the funds thus contributed be devoted to fire prevention rather than in paying for fire fighting. The appropriation received by Maryland in the federal fiscal year ending June 30, 1930, amounted to $10,169. For the fiscal year beginning July 1, 1930, the appropriation increased to $10,289. Federal contributions have been steadily increasing

since the passage of the law and have played an important part in promoting the State forestry program. State budget figures allow little leeway for meeting emergency situations such as continually arise in fire control activity. Federal allotments have provided a contingent fund which enabled a more efficient attention to unexpected problems. In previous years, the federal funds have been largely devoted to the purchase of equipment, lookout towers, and fire fighting tools. The year 1930 proved so severe that State allotments for lookout-watchmen, forest guards, and telephone service were quickly exhausted, making federal aid in this difficult period most timely and important. In so far as possible, it is the policy of the Department of Forestry to use the federal funds in extending activity into new fields of endeavor, in an effort to develop new and effective methods of fire prevention. The District Forest Inspector of the Forest Service, who is assigned in this section of the United States, analyses the expenditures and makes periodic inspections of the work of the organization.

Adjoining States.

The States of West Virginia and Pennsylvania cooperate with the Department of Forestry in handling the forest fire problem along state boundary lines. The Snaggy Mountain lookout tower on the western boundary of the State is maintained cooperatively by Maryland and West Virginia. Dan's Rock and Warrior Mountain towers in Allegany County provide detection for portions of West Virginia. In return for this service, West Virginia has provided detection for a large area in southeastern Garrett County from their lookout station on Pinnacle Rock. Most unfortunately, the long-extended period of fire danger in 1930 quickly exhausted West Virginia's funds, making it necessary for them to close the Pinnacle Rock lookout station, to the decided disadvantage of Maryland. Maryland towers continued to report fires in West Virginia.

During 1930, numerous fires burned on the Maryland-Pennsylvania line, which were energetically attacked by forest wardens from both states. Employees from either state

crossed the line to assist in controlling fires in the neighboring state and were reimbursed by the state in which the service was performed. Thus, at various times, both states recognized services performed within its boundary by employees from the neighboring state. This arrangement resulted in real efficiency along the boundary line.

A similar activity occurred along the Maryland-Delaware line, but was less satisfactory due to lack of funds for fire fighting in Delaware. Fires in both states were extinguished, however, by control forces from the neighboring state.

The Counties.

Under a law passed in 1912, the County Commissioners of the various Maryland counties are required to settle the cost of forest fire fighting in full, after which the Department of Forestry reimburses the county for one-half the amount. The burden laid upon the counties because of the extremely large fire fighting accounts in 1930 was quite heavy. Most counties met the problem creditably, although slow payment discouraged the fire control forces in some counties. Allegany County's splendid response in immediately settling accounts amounting to $16,463 was most commendable. Realizing the very unusual fire conditions which existed, the county drew upon a contingent fund which had never previously been used during the history of the county. At the time of the particularly threatening fire on Dan's Mountain, early in August, the county sent six special deputy sheriffs into the mountain in an effort to assist the Department of Forestry in apprehending persons setting out fire.

Anne Arundel County is taking an increasing interest in her forest fire problem, which is one of the most serious in the State. During 1930, the county contributed $400 towards a lookout tower, which is to be erected in 1931, near Hillmeade, Prince Georges County. The proposed tower will provide detection for a very important forest area in Anne Arundel County.

Frederick City.

There has been a very severe forest fire problem in the

Catoctin-South Mountain area of Frederick County for a good many years. The City of Frederick has developed a city water supply in this area and now owns approximately 6,000 acres of forest land on the headwaters of Fishing and Hunting Creeks. This area, while producing a valuable water supply, is to be developed into a commercial forest. The Department of Forestry has been cooperating with the city in an effort to solve the fire problem. Through the cooperative effort the Hamburg Forest Fire Tower has been equipped and is operated for the protection of the city forest and adjacent lands; a full-time City Forester is employed who polices the area during periods of fire danger; and all necessary services in fire fighting are handled in the usual manner by the State and the county. In addition, the city has constructed a forest guard's station at Five Forks on the area, and keeps a forest guard on duty during fire seasons, special fire fighting tools for the area have been provided, and extensive fire lines are being constructed, cutting the area up into smaller protective blocks. Considerable time is spent each year by the cooperating agencies in educational effort among the mountain people. Lectures, literature, and motion pictures are utilized in encouraging fire prevention. More vigorous methods appear necessary in correcting the prevalence of incendiarism.

Volunteer Fire Companies.

The activity and efficiency of the volunteer fire companies of the State have increased materially during recent years, due to a better knowledge of methods of forest fire suppression. The Department of Forestry is now cooperating with about 60 volunteer fire companies scattered throughout the State. A member of each company has been commissioned as forest warden by the Governor and serves as an officer of the company, directing forest fire control activity. In addition to the fire fighting tools supplied by the Department, many companies have purchased additional equipment especially for forest fire control. Several volunteer organizations have secured special forest fire trucks, so that more expensive equipment can be retained in town for the protection of buildings. The organization of registered forest fire crews within the companies is

also tending to improve the efficiency through special training of a picked group of men. Volunteer fire companies and regular forest wardens' crews are working together with increasing efficiency and less friction than before the Department of Forestry started to coordinate the effort.

Industries and Institutions.

Special fire fighting crews have been organized through the assistance of industrial concerns. One of the perplexing problems in fire control work is to find on short notice sufficient dependable labor to control very difficult fires, which are periodic in their occurrence. As a result of an effort started in 1927, a number of large industrial firms, largely in Western Maryland, have permitted the organization of special suppression crews among their employees. During 1930, crews from the Ox-Fibre Brush Company, the Frederick Iron Works, and the Izaak Walton League, all of Frederick, have performed very valuable service in controlling fires on Catoctin Mountain. Other important cooperators were the Consolidation Coal Company of Frostburg, the Georges Creek Coal Company of Midland, and, to some extent, the Kelly-Springfield Tire Company and the Potomac Edison Company, both of Cumberland. The Savage Manufacturing Company of Savage, Howard County, and the Whitaker Iron Company of Principio Furnace, Cecil County, have rendered valuable aid. All crews have been equipped with fire fighting tools and are available at any time on short notice.

The Cheltenham Reform School for Colored Boys and the Crownsville State Hospital have taken an active part in forest fire control in 1930, through authorized employees who are commissioned forest wardens. The Cheltenham School, under the direction of Superintendent J. B. Pyles, has rendered splendid assistance at the call of the Brandywine Forest Fire Tower.

Other Agencies.

The Chesapeake and Potomac Telephone Company carries a list of forest wardens on the back page of each telephone directory published in the State. This is an important aid in the reporting of forest fires to the forest wardens.

FIG. 1—A TYPICAL SCENE ON SAVAGE RIVER STATE FOREST, GARRETT COUNTY.

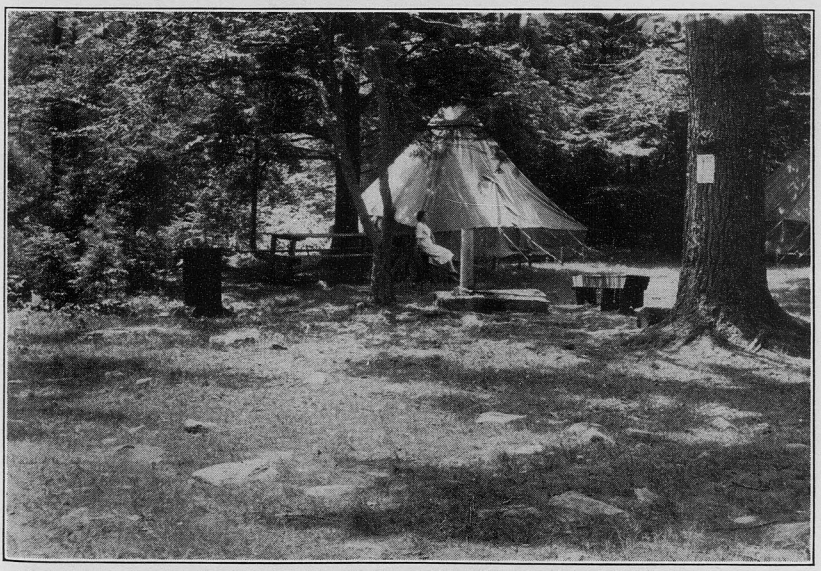

FIG. 2—CAMPING IS POPULAR ON SWALLOW FALLS STATE FOREST, GARRETT COUNTY.

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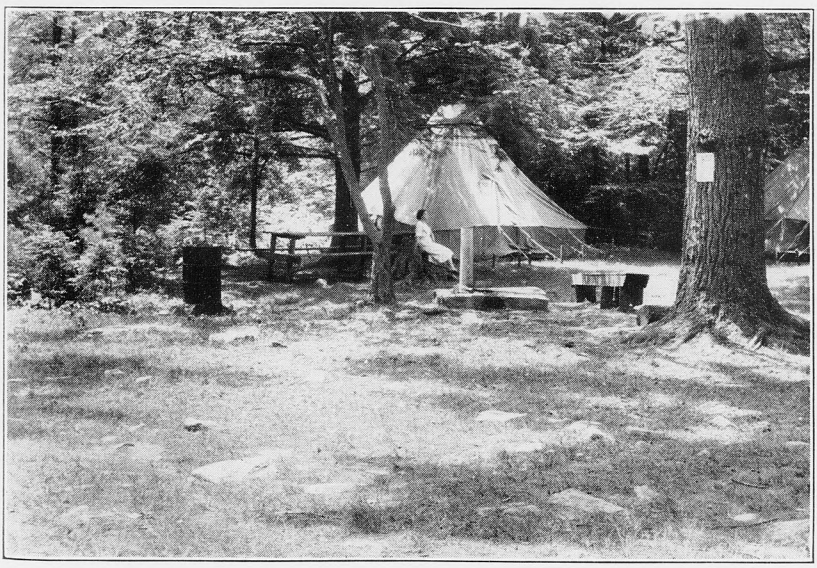

FIG. 2—CAMPING IS POPULAR ON SWALLOW FALLS STATE FOREST, GARRETT COUNTY.

All State policemen are commissioned forest wardens and give frequent aid in reporting forest fires and in law enforcement work. Officers assigned to the Cumberland substation gave efficient aid in conscripting help at the time of the serious 1930 Dan's Mountain fire, frequently using force in placing laborers on the fire lines. The State Game Department cooperates in fire control through the posting of fire warning notices and in printing fire warnings on all hunting licenses. All Game Department employees are instructed as to the location of forest wardens, and are requested to report forest fires promptly. Deputy game wardens in Charles, Prince Georges and Allegany Counties have aided on the fire lines in fire suppression.

Fire Prevention

To most persons there is no clearly defined difference between fire prevention and fire suppression, yet activities are distinctly different. While prompt and energetic action is necessary in suppressing fires in order to hold them to the minimum damage, the actual act of fire fighting accomplishes little in preventing the fire from starting. Forest protection efficiency is improving from year to year in so far as fire suppression is concerned, because the size of the average fire is being gradually reduced, but the real difficulty lies in the fact that greater numbers of fires are occurring each year. Better methods of prevention are necessary in order to correct this tendency.

Fire Warning Posters.

No new fire warning signs were designed during the year as a sufficient supply of signs purchased in 1929 was on hand. Forest wardens and employees were directed in posting these warnings in forest areas throughout the State. The policy of erecting special sign backs along State highways at two-mile intervals was continued, many new signs being erected on the Eastern Shore. Existing sign posts were maintained, repaired where necessary and new posters attached. Much comment is received regarding the use of these posters, indicating that they reach the attention of the public.

Railroad Fire Hazards.

The railroad fire hazard law of 1924 requires all railroads to clear annually, between October 1 and April 15, a 100-ft. strip along their rights-of-way wherever the Department of Forestry has determined that a hazard exists. The Department of Forestry, under the law, obtains permission from the property owners for the clearing of the safety strips. In the event the permission is refused, the law requires that the landowner shall clear the safety strip at his own expense. The permits are turned over to the railroads in the late summer of each year, and the railroad is notified of the necessity of clearing the safety strips prior to April 15. During the last few years, the Department has made a policy of requesting all railroads to clear safety strips prior to March 15, inasmuch as experience has shown that unless fire hazards are clean prior to that date many fires may be set prior thereto, as many spring fires occur between March 15 and April 15. Difficulty has been experienced in securing full compliance with the requirements, but the clearing procedure has been gradually improving from year to year. The big problem has been to inform the railroad employees as to the methods desired.

Difficulty has been experienced for some time in securing an efficient safety strip cleared along the Pennsylvania Railroad between Washington and Baltimore, where frequent serious railroad fires have occurred. In order to make certain that the railroad employees are entirely familiar with the desired cleaning procedure, field demonstrations of approved methods were held by the Department of Forestry for the benefit of track foremen at Seabrook on October 13 and at Severn on October 20. Another demonstration was held a little later at Brandywine on the Pope's Creek Branch. As a result of these demonstrations, there has been marked improvement in safety-strip construction on this line. The Department of Forestry intends to extend demonstrations into other parts of the State.

Naturally enough, the number of railroad fires increased during 1930, as did fires from all causes, due to the high hazard, 228 or 9 per cent of the forest fires in the State being listed as caused by railroads. However, the percentage has

decreased materially as 16 per cent of the fires were caused by railroads in 1929. Railroad fires burned 5,827 acres in 1930, or 6 per cent of the total area, which is an acre increase, but a decline in percentage. The damage amounted to $25,775, or 1 per cent of the total damage, which compares to previous years in the same manner that number and acreage figures compare. Due to the large increase in fire hazard and consequent increased number of fires from other causes, it is difficult to know whether the decline in number, acreage, and damage percentages was due to the safety-strip work. A comparison of percentages during normal fire years, which was not true of 1930, should be a better measurement of the fire prevention efficiency of the safety strips.

Claim Collections.

The prevention of forest fires which are caused through carelessness in burning brush and other debris has been a problem of increasing importance during recent years. Prevention effort has been extended during 1930 by means of press notices and vigorous warnings administered by departmental officials and forest guards to persons doing burning. The most effective prevention method, however, has been through the collection of expenses incurred in fire fighting from persons responsible for escape of fire. In thus laying the cost of fire fighting on the parties responsible for the fire, the Department of Forestry is impressing careless individuals with the need for greater care with fire while at the same time relieving the taxpayer from bearing the fire fighting bills. During 1930, collections were made from 100 persons, amounting to $1,343.86. Few persons pay fire fighting costs willingly and frequently it is necessary to arrange settlement through special agreements. Court action is taken only as a last resort, where persons are unreasonable or fail to fulfill agreements.

Law Enforcement.

Persons who fail to make proper response to requests for settlement of fire fighting accounts, which have been incurred because of their carelessness, are required by means of court action to make payment. Second offenders, or those causing fires after being warned, are taken into court under criminal

charges, subject to fine or imprisonment. Occasionally, forest wardens are successful in apprehending persons who cause fires maliciously, in which case the severe criminal charge of incendiarism is sworn against the offender, usually resulting in jail sentence. During 1930, five persons were thus fined or imprisoned, because of violation of the fire laws. In administering the law, the Department of Forestry is making every effort to handle the responsibility in a reasonable and fair manner, applying corrective measures according to the merits of individual cases. Whenever possible, effort is made to enlist cooperation through persuasion, only resorting to more forceful methods when others have proven ineffective.

Other Agencies.

The 650 forest wardens of the State, with their 1,500 registered crew men, located in all important forested areas of Maryland, serve as a very important fire prevention agency. These fire-conscious citizens are constantly, through persuasion and personal example, calling the attention of their neighbors to the importance of fire prevention. Likewise, the salaried members of the organization, from the State Forester to part-time forest guards, are constantly engaged in fire prevention activities by visits to schools and by personal contacts. Many interested cooperators are also taking up the campaign for more effective fire prevention.

Fire Preparedness

Forest fires cannot be promptly reported and quickly attacked unless definite preparation is made for fire fighting activity, prior to the occurrence of fires. Special improvements, equipment, and arrangements must be assured in advance in order that efficient fire control can be a certainty.

The Fire Detection System.

Since 1915, Maryland has been constructing special forest fire lookout towers at strategic points throughout the State. Citizens of the State have had only an occasional contact with the development of this system of steel lookout towers. The growth has been so gradual that few have realized the careful

surveys and plans necessary in the selection of tower sites. If towers are improperly located, they can easily interfere seriously with the further development of the system, when other towers are to be established. In order to insure construction of towers at the most desirable locations and in such a manner that an interlocking vision of all important forest areas will result, a carefully studied plan for tower construction has been worked out. Under this plan, a system of 30 to 35 primary towers will be necessary in order to protect the woodlands of Maryland. In addition to these, four or five towers at adjacent points in Pennsylvania and West Virginia will be desirable in overlooking Maryland areas.

In general, a properly located tower can be counted upon to permit adequate detection for a radius of 10 miles from the tower, provided intervening elevations are not too high. Where no obstruction exists, this will permit location of towers a distance of 18 to 20 miles apart. Usually, however, the distances have to be varied considerably in order to secure the proper elevation for tower sites and to obtain direct visibility of particularly hazardous areas. Smokes which can be sighted by two or more towers can always be located more accurately than when sighted by only one tower. This is because of the triangulation which is usually possible, each tower reading the compass bearing of the smoke and reporting the reading to a district office, where it can be rapidly plotted on a specially prepared map, giving the exact location of the smoke. Because of this method, additional towers are continually increasing the efficiency of existing towers, while at the same time providing detection for new areas.

Maryland's first tower detection was provided by a 60-ft. tower erected in 1915, near Bittinger, on Meadow Mountain, in Garrett County. Since that time other towers have been built gradually as private funds and federal aid have been provided, until there existed 14 towers in 1930. The towers that performed service during the year were as follows:

	Began Operation	Tower	County	Height
1.	1915	Bittinger	Garrett	60
2.	1918	Snaggy Mountain	Garrett	40
3.	1920	Foxville	Frederick	50
4.	1921	Thayerville	Garrett	47
5.	1921	Dan's Rock	Allegany	15
6.	1922	Warrior Mountain	Allegany	47
7.	1922	Quirauk	Washington	80
8.	1923	Long Hill	Anne Arundel	60
9.	1924	Foy's Hill	Cecil	60
10.	1926	Muirkirk	Prince Georges	60
11.	1926	Hamburg	Frederick	60
12.	1928	Brandywine	Prince Georges	93
13.	1929	Nassawango	Worcester	120
14.	1929	Stoney Forest	Harford	80

The tower at Stoney Forest, Harford County, was not completed until during the fall of 1929, and was therefore not thoroughly tested until during the serious fire conditions of 1930. It proved very satisfactory, tying in nicely with service rendered from the Foy's Hill tower in Cecil County.

Inasmuch as the Maryland tower system is little more than half completed, it is hoped that funds may be available for pushing the development of the system along a little more rapidly in the near future. The severe fire conditions of 1930 clearly indicated the need of the early completion of the system.

Telephone Connections.

Next to a means of prompt discovery of all fires, a method of reporting fires immediately to the forest wardens is of primary importance. Telephone communications constitute the simplest and most efficient means of reaching a widely distributed organization. All lookout towers are equipped with telephone as soon as erected. Even though forest wardens who have telephones at their homes are much more desirable than those who are without telephones, it is frequently difficult or impossible to select men with telephones. Even in as heavily populated a state as Maryland, there are many sections of the State where there are few or no telephone lines. Naturally enough these sections are in areas with a high percentage of forest land, where there is even greater need for efficient protection from fire.

The Department of Forestry has never had sufficient funds

to build extensive telephone lines. It has actively urged all forest wardens to secure telephone facilities and will assist any forest warden in installing telephone service by sharing the cost of installation. In this manner, a number of additional forest wardens were induced to install telephones during 1930.

The establishment of the State forest purchase areas on Savage River, Garrett County, and the location of a forest guard on the new public forest area, made it imperative that telephone connection be provided between the guard's station and the Bittinger Forest Fire Tower, in order that fires originating on or near the area could be reported promptly. This was accomplished early in March through the construction of a four-mile telephone line extension from the foot of Meadow Mountain along the Dry Run Road to the Dry Run schoolhouse, and thence through the woods down Horse Hollow to the guard station at Bond on Savage River. This is an important link in the protection facilities for Garrett County.

Forest Fire Tools.

The Department of Forestry has, for some years, endeavored to equip the forest wardens of the State with special forest fire tools. This has not been easy to attain as breakage and loss is high in the difficult work of forest fire control. The most satisfactory forest fire tools have proven to be: A special rake with mowing-machine blades serving as teeth, the portable knapsack fire pump, and a specially constructed kerosene torch for use in back-firing. Effort has been made to equip each forest warden with two rakes, a torch, and a pump. Occasionally, additional equipment, consisting of brush hooks, axes, cross-cut saws, canvas buckets, and miners' lamps, are provided where special crews exist. Some volunteer fire companies, registered fire crews, and local civic organizations have assisted in preparing for action by purchasing additional equipment through the Department of Forestry. It is undoubtedly true that fire fighting efficiency has been greatly improved through the use of this special equipment. The tools now available and their state of repair are far from satisfactory, but with gradually increasing funds, the Department hopes eventually to put the fire control facilities of the State

FIG. 1—A PROMISING YOUNG PINE FOREST WITH ITS LEAF LITTER AND HUMUS DESTROYED BY FIRE.

FIG. 2—UNBURNED PINE STAND, NOTE THE ABUNDANCE OF HUMUS.

to build extensive telephone lines. It has actively urged all forest wardens to secure telephone facilities and will assist any forest warden in installing telephone service by sharing the cost of installation. In this manner, a number of additional forest wardens were induced to install telephones during 1930.

The establishment of the State forest purchase areas on Savage River, Garrett County, and the location of a forest guard on the new public forest area, made it imperative that telephone connection be provided between the guard's station and the Bittinger Forest Fire Tower, in order that fires originating on or near the area could be reported promptly. This was accomplished early in March through the construction of a four-mile telephone line extension from the foot of Meadow Mountain along the Dry Run Road to the Dry Run schoolhouse, and thence through the woods down Horse Hollow to the guard station at Bond on Savage River. This is an important link in the protection facilities for Garrett County.

Forest Fire Tools.

The Department of Forestry has, for some years, endeavored to equip the forest wardens of the State with special forest fire tools. This has not been easy to attain as breakage and loss is high in the difficult work of forest fire control. The most satisfactory forest fire tools have proven to be: A special rake with mowing-machine blades serving as teeth, the portable knapsack fire pump, and a specially constructed kerosene torch for use in back-firing. Effort has been made to equip each forest warden with two rakes, a torch, and a pump. Occasionally, additional equipment, consisting of brush hooks, axes, cross-cut saws, canvas buckets, and miners' lamps, are provided where special crews exist. Some volunteer fire companies, registered fire crews, and local civic organizations have assisted in preparing for action by purchasing additional equipment through the Department of Forestry. It is undoubtedly true that fire fighting efficiency has been greatly improved through the use of this special equipment. The tools now available and their state of repair are far from satisfactory, but with gradually increasing funds, the Department hopes eventually to put the fire control facilities of the State

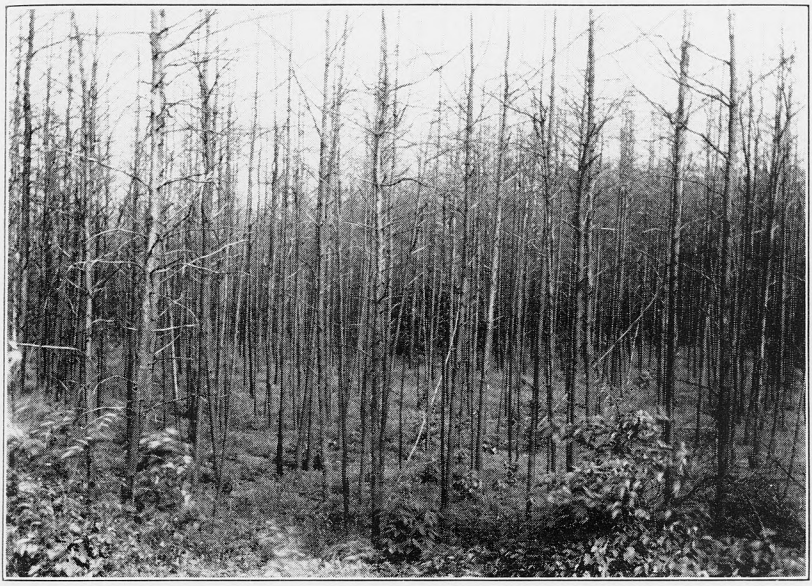

FIG. 1—A PROMISING YOUNG PINE FOREST WITH ITS LEAF LITTER AND HUMUS DESTROYED BY FIRE.

FIG. 2—UNBURNED PINE STAND, NOTE THE ABUNDANCE OF HUMUS.

on a decidedly improved basis. The unusually severe fires of 1930 have been particularly hard on fire fighting tools.

Forest Warden Conferences.

Five forest warden conferences were held in the spring of 1930. On February 25, the first conference of the year was held for Southern Maryland wardens at La Plata, followed the next day by an unusually successful conference at College Park, attended by wardens from Anne Arundel, Montgomery, and Prince Georges Counties. One week later, wardens from Cecil, Queen Annes and Kent Counties assembled at Elkton on March 4. The final conferences of the series were held for Allegany County wardens at Cumberland on March 5, and in Frederick County on March 6. All conferences were well attended.

These conferences serve as the annual training schools where new forest wardens are instructed in the rudiments of forest fire control work, and experienced fire fighters are informed of improved methods and standardized procedures. Interesting discussions are frequent regarding new methods and various suggestions regarding forest protection are considered. Members of the United States Forest Service, neighboring states, civic organizations, and the Forestry Department speak at the conferences. Fire fighting tools and statistical charts are demonstrated and motion pictures of an educational type concerning forestry are shown. Men of little actual experience or training in forestry are thus given a real insight into the forestry movement and their interest in forest protection is definitely enlivened.

Other Improvements.

Late in 1929 a combined workshop and garage was built at the Muirkirk Forest Fire Tower and received intensive use during 1930. The forest guard stationed at the tower spent his time, while waiting for fire calls, working in the shop. On damp or rainy days the watchman from the tower joined him in the shop. In this manner the full time of these employees was utilized, resulting in repair of damaged fire tools, preparation of sign posts and sign backs for mounting, con-

struction of special fire tool boxes for the forest wardens, and many other worth-while details. The shop clearly demonstrated the practicability of utilizing the contributive time of fire employees during periods of low fire hazard in better preparing the forest wardens for fire fighting.

The enamel forest warden signs purchased in 1929 were given further distribution and a standard sign post and frame mounting for the back was adopted for use throughout the State. It was found that if the forest wardens were allowed to erect the signs according to their individual notions, signs were frequently erected in a careless manner, or in an obscure location. These attractive green and white signs bearing the wording "Forest Warden, Report Forest Fires Here" when carefully erected are a real advantage in enlisting the cooperation of the public in reporting fires promptly. In addition the local forest warden becomes known in his immediate community and is thereby given better opportunity to exert an influence in forest fire prevention. Comparatively few sections of the State are yet to be supplied with these signs, their use doing much to increase the knowledge of the services performed by the Department of Forestry.

A start was made during the year in preparing a special tool box in which the forest wardens could keep their fire tools. Experience has shown that only occasional individuals are careful and orderly with their equipment, valuable tools frequently being left in the weather or misplaced altogether. The forest warden's helpers or registered fire crew are frequently unable to find the tools in the absence of the warden. A specially designed tool box which opens on the side, which is painted bright red, seems to answer the purpose, enabling quick location of the tools at the moment of need. Officials inspecting the warden's tools can always get at them, supplying repairs when necessary. More extensive installation of these tool boxes is contemplated.

Forest Fires in 1930

The statistics on forest fires for the calendar year 1930 will be found in the tables following this report. The seriousness of the drought and fire hazard during the year makes it diffi-

cult to decide whether little, if any, progress was made during the year in attaining more efficient forest fire control. In spite of the great loss and expense there are many encouraging aspects.

The total of 2,313 fires indicates clearly the seriousness of the conditions which existed. This number of fires is over three and one-half times as many as were reported in 1928, in which year 634 fires constituted the greatest number to have been recorded in any one year previous to 1930. About 20 fires occurred during the first 10 days of January, pretty well scattered over the State. Continuous fire conditions opened on February 20, and progressed with increasing intensity until past the middle of May. Definite relief did not occur until June 6, when humid conditions stopped occurrence of fires, but no rain of any importance fell. The unprecedented summer drought first made its presence felt when fires reappeared on July 4, and the most destructive fires yet experienced in Maryland occurred during July and August. Fire conditions continued unabated until the middle of November, at which time relief was experienced in District III, the Eastern Shore. Conditions were not relieved in District II, the Western Shore, until November 28, and on December 9, in District I, Western Maryland. A few scattered fires occurred on the Western Shore even after these dates. It can truly be said that there were few days in 1930 which were not fire days.

The total area burned in 1930 amounted to 102,311 acres, the largest area ever to have been burned within one year in Maryland. Consequently, it is with surprise that we find there is some encouragement in the size of the average fire which is usually recognized as an indicator of fire fighting efficiency. The figure for 1930 is 44 acres. This is not as good as the record of 41 acres in 1924, 19 acres in 1927, and 31 acres in 1929. The year 1929 was regarded as a fire year of normal hazard, while 1924 and 1927 were both regarded as decidedly subnormal. It is natural that the organization should be able to attain a better efficiency rating during years when fire conditions are not beyond normal. All the other years during the 10-year period, 1921 to 1930, as indicated by Maryland fire records, have been more severe than the years 1924, 1927, and

1929. In 1928 the size of the average fire was 51 acres, and in 1926, an especially severe year, the average fire amounted to 110 acres. It should, therefore, be gratifying to the forest wardens to note that during the worst year on record, 1930, their organization has attained an efficiency record which is better than any of the severe years during the past 10-year period.

There were 15 fires over 1,000 acres in size. Seven of these occurred between April 1 and May 5. The largest fire of the year occurred on Dan's Mountain in Allegany County, burning 7,400 acres, on July 28 to August 10. The Frederick City watershed on Catoctin Mountain, which the Department of Forestry and the City of Frederick have been cooperating to protect, was visited by a 4,000-acre fire on May 4 to 8. Large fires were located in all important forested counties of the State. Fires broke out repeatedly and deep trenching and extended patrol proved necessary. A 500-acre fire in Charles County was patrolled for 40 days before finally extinguished. Unusually high summer temperatures also hampered the fire fighters, at times reaching as high as 110 degrees in the shade.

Efficiency in fire fighting was hampered at times due to slowness in paying the fire fighters. The counties, being unaccustomed to paying such large fire fighting accounts, quickly used up the funds provided for this purpose and delayed payments for long periods, thus discouraging the morale of the fire fighters. The Department of Forestry further embarrassed the counties through slow reimbursement of one-half of the fire fighting expense. This was because the $4,000 provided for fire fighting in the spring of 1930 was quickly obligated during the first few weeks of the season. Because of the continued unseasonable summer fires, an emergency loan of $10,000 was authorized by Governor Ritchie in July, which took care of the obligations to July 1. Late summer fires obligated all of the $4,000 provided in the budget for the fiscal year which opened October 1. Fire fighting accounts incurred on fires during the last four months of the year were carried forward as unpaid obligations into 1931. Thus, the tremendous burden of fire control during 1930 was faced and combated without funds to meet the situation. The desirability of a contingent fund for severe years was clearly indicated.

The estimated damage was $661,011, and the cost of fire fighting was $64,086, a tremendous expense largely attributable to preventable causes. Yet, had not the control effort been exerted, the loss would have certainly been many times greater.

In the classification of fires according to causes, "smoking" leads with 879 fires, or 38 per cent. "Brush burning" is next with 394 fires, or 17 per cent, followed by "incendiary" causing 385 fires, or 17 per cent of the total. Fires in the "unknown" class totaled 96, or 8 per cent. "Miscellaneous" accounted for 154 fires, while "campers" were responsible for 39 fires and "lumbering" 24. Lightning" caused 14 fires during the unusual summer period of drought.

Divided according to area classes the fires were as follows:

Less than ¼ acre	130
From ¼ to 10 acres	1,358
From 11 to 100 acres	653
From 101 to 1,000 acres	160
Over 1,000 acres	12
Total	2,313

Prince Georges County had the greatest number of fires with 487. Other counties with a large number of fires are as follows: Allegany, 293; Garrett, 257; Anne Arundel, 237; Worcester, 110. All other counties had less than 100 fires. It is interesting to note that although Prince Georges County had nearly twice as many fires as any other county, the acreage burned was one-third of that in Allegany or Garrett Counties, and one-half of that in Anne Arundel County. It is felt that this is due to the efficiency of the 19 volunteer fire companies and the adequate man-power in Prince Georges County.

The Department of Forestry is striving to reduce the acreage burned in any one year to 1/10 of 1 per cent of the forest area of the State. During 1930 the acreage burned amounted to 4.6 per cent of the forest area, or 46 times as much as is allowable under safe forest management. The problem, therefore, in reducing the fire risk is not only the reduction in the size of the average fire through fire fighting efficiency, but complete prevention of many fires which occur under existing conditions. Fire prevention can be promoted by any person and should have a definite place in every citizen's activity.

TABLE I—FOREST FIRES BY SEASONS IN THE COUNTIES

January 1 to December 31, 1930

County	Spring, 1930				Fall, 1930			
	No.	Acreage	Damage	Expense	No.	Acreage	Damage	Expense
Allegany	118	5,464 7/12	$10,276.30	$1,909.92	175	13,480 1/2	$37,469.70	$14,553.45
Anne Arundel	118	7,941 1/2	176,891.08	1,982.23	119	5,400 1/16	19,643.72	2,213.37
Baltimore	22	184 1/2	777.90	46.38	60	1,575 5/8	8,128.85	915.05
Calvert	5	722 1/2	13,905.00	237.06	..	.....	.....	.....
Caroline	19	743	9,180.50	312.84	16	610 1/4	7,208.50	282.48
Carroll	..	....	.....	.....	1	50	625.00	7.75
Cecil	51	1,601 3/4	2,403.00	955.00	30	404 3/4	1,422.50	520.12
Charles	25	381 1/2	4,443.40	237.01	20	1,053 7/8	1,066.02	659.02
Dorchester	25	3,619 1/2	17,636.00	471.15	52	2,122 3/4	17,483.00	1,979.30
Frederick	23	4,260 5/8	6,543.50	1,929.59	26	1,143 1/2	1,887.75	2,095.92
Garrett	156	8,647 7/8	16,685.00	2,515.00	101	7,806 1/2	8,268.67	4,532.14
Harford	25	431	2,526.00	223.99	19	419 3/4	1,965.95	230.05
Howard	22	495 7/8	882.95	228.85	43	816 1/4	3,565.95	957.87
Kent	2	44	240.00	8.67	10	757 1/4	4,174.00	104.75
Montgomery	42	1,401 3/4	5,629.70	392.85	38	271	1,209.30	416.87
Prince Georges	238	3,513	35,283.18	3,345.85	249	2,991 1/6	21,053.33	4,772.89
Queen Annes	4	375	6,762.50	29.77	4	106	1,395.00	103.70
St. Marys	31	1,292	9,648.50	604.23	20	547 1/2	6,244.20	511.60
Somerset	22	910 1/3	5,815.00	348.70	46	3,673 7/12	32,811.00	905.17
Talbot	12	84 5/12	1,023.50	117.20	33	351 1/8	2,339.50	480.01
Washington	23	535	1,048.75	527.41	66	2,180 1/4	7,026.50	2,608.36
Wicomico	50	3,772	35,445.50	1,149.97	42	2,561 5/8	15,532.50	2,463.30
Worcester	48	5,496 5/8	81,888.00	2,188.83	62	2,069	15,555.10	1,884.03
Total	1081	51,918 1/3	$444,935.26	$19,762.50	1232	50,392 5/16	$216,076.04	$43,197.20
False Alarms	147	.....	.....	737.65	67	.....	.....	388.30
	1228	.....	.....	$20,500.15	1299	.....	.....	$43,585.50

TABLE II—FOREST FIRES BY COUNTIES

January 1 to December 31, 1930

County	No.	Acreage	Damage	Expense
Allegany	293	18,945 1/12	$47,746.00	$16,463.37
Anne Arundel	237	13,341 9/16	196,534.80	4,195.60
Baltimore	82	1,760 1/8	8,906.75	961.43
Calvert	5	722 1/2	13,905.00	237.06
Caroline	35	1,353 1/4	16,389.00	595.32
Carroll	1	50	625.00	7.75
Cecil	81	2,006 1/2	3,825.50	1,475.12
Charles	45	1,435 3/8	5,509.42	896.03
Dorchester	77	5,742 1/4	35,119.00	2,450.45
Frederick	49	5,404 1/8	8,431.25	4,025.51
Garrett	257	16,454 3/8	24,953.67	7,047.14
Harford	44	850 3/4	4,491.95	454.04
Howard	65	1,312 1/8	4,448.90	1,186.72
Kent	12	801 1/4	4,414.00	113.42
Montgomery	80	1,672 3/4	6,839.00	809.72
Prince Georges	487	6,504 1/6	56,336.51	8,118.74
Queen Annes	8	481	8,157.50	133.47
St. Marys	51	1,839 1/2	15,892.70	1,115.83
Somerset	68	4,583 11/12	38,626.00	1,253.87
Talbot	45	435 13/24	3,363.00	597.21
Washington	89	2,715 1/4	8,075.25	3,135.77
Wicomico	92	6,333 5/8	50,978.00	3,613.27
Worcester	110	7,565 5/8	97,443.10	4,072.86
Total	2,313	102,310 31/48	$661,011.30	$62,959.70
False Alarms	214	.....	.....	1,125.95
	2,527	.....	.....	$64,085.65

TABLE III—CAUSES OF FOREST FIRES BY COUNTIES

January 1 to December 31, 1930

County	Lightning	R. R.	Campers	Smoking	Brush Burn'g	Incendiary	Lumbering	Misc.	Unknown	Total	False Alarm
Allegany	..	22	12	122	28	62	2	27	18	293	55
Anne Arundel	..	11	4	136	48	24	1	12	1	237	13
Baltimore	..	10	3	39	14	12	..	4	..	82	..
Calvert	..	..	..	2	3	..	..	..	..	5	..
Caroline	..	3	..	9	9	..	..	5	9	35	1
Carroll	..	1	..	..	..	..	..	..	..	1	..
Cecil	..	19	2	16	5	3	..	4	32	81	6
Charles	..	7	..	18	12	2	2	4	..	45	17
Dorchester	1	5	..	29	11	10	2	8	11	77	2
Frederick	..	3	..	21	7	13	..	2	3	49	3
Garrett	..	17	4	80	17	106	1	13	19	257	45
Harford	..	7	..	24	1	6	1	4	1	44	2
Howard	..	10	3	26	16	7	1	2	..	65	1
Kent	..	1	..	2	2	..	..	2	5	12	..
Montgomery	1	3	2	26	26	14	1	4	3	80	..
Prince Georges	2	82	6	169	102	48	1	24	53	487	10
Queen Annes	..	..	..	4	4	..	..	..	..	8	..
St. Marys	..	1	..	23	13	9	..	5	..	51	2
Somerset	1	7	..	27	10	12	1	8	2	68	1
Talbot	..	5	..	18	13	1	1	4	3	45	..
Washington	1	3	1	32	4	34	..	5	9	89	3
Wicomico	3	3	..	31	27	4	2	5	17	92	21
Worcester	5	8	2	25	22	18	8	12	10	110	32
Total	14	228	39	879	394	385	24	154	196	2313	214
Per cent	1	9	2	38	17	17	1	7	8	100	..

TABLE IV—DAMAGE OF FOREST FIRES BY CAUSES

January 1 to December 31, 1930

Cause	No.	Per cent	Area	Per cent	Damage	Per cent
Lightning	14	1	1,930	2	$7,930.25	1
Railroad	228	9	5,827	6	25,775.58	4
Campers	39	2	1,647½	1	4,582.85	1
Smoking	879	38	35,712 13/16	35	300,493.94	45
Brush burning	394	17	17,082⅝	17	157,621.75	24
Incendiary	385	17	24,432¾	24	77,663.70	12
Lumbering	24	1	1,513	1	17,592.50	3
Miscellaneous	154	7	8,392 23/24	8	41,756.83	6
Unknown	196	8	5,771 1/24	6	27,593.90	4
Totals	2,313	100	102,310 3 1/4 8	100	$661,011.30	100
False Alarms	214					
	2,527					

TABLE V—NUMBER AND PERCENTAGE OF FIRES BY DISTRICTS

January 1 to December 31, 1930

	No.	Per cent
District 1—Western Maryland—Allegany, Frederick, Garrett, Washington	688	30
District II—Western Shore—Anne Arundel, Baltimore, Calvert, Carroll, Charles, Harford, Howard, Montgomery, Prince Georges, St. Marys.	1,097	47
District III—Eastern Shore—Caroline, Cecil, Dorchester, Kent, Queen Annes, Somerset, Talbot, Wicomico, Worcester	528	23
	2,313	100

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TABLE VI—FIRES BY AREA CLASSES

January 1 to December 31, 1930

County	¼ Acre or less	¼-10	11-100	101-1,000	Over 1,000	Total
Allegany	8	185	80	16	4	293
Anne Arundel	10	123	81	20	3	237
Baltimore	2	54	23	3	..	82
Calvert	..	1	2	2	..	5
Caroline	1	15	16	3	..	35
Carroll	..	..	1	..	..	1
Cecil	3	46	29	3	..	81
Charles	4	30	9	2	..	45
Dorchester	1	43	20	13	..	77
Frederick	4	34	5	5	1	49
Garrett	9	109	107	30	2	257
Harford	..	30	13	1	..	44
Howard	4	44	13	4	..	65
Kent	..	6	5	1	..	12
Montgomery	4	59	16	1	..	80
Prince Georges	50	350	76	11	..	487
Queen Annes	..	3	4	1	..	8
St. Marys	..	27	19	5	..	51
Somerset	1	32	25	10	..	68
Talbot	2	34	9	..	..	45
Washington	4	52	28	5	..	89
Wicomico	7	38	34	12	1	92
Worcester	16	43	38	12	1	110
Total	130	1,358	653	160	12	2,313

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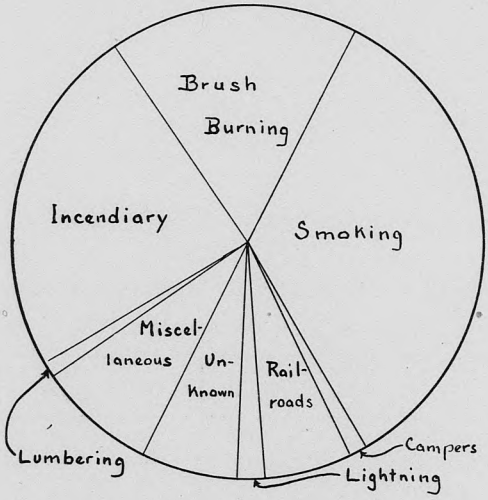
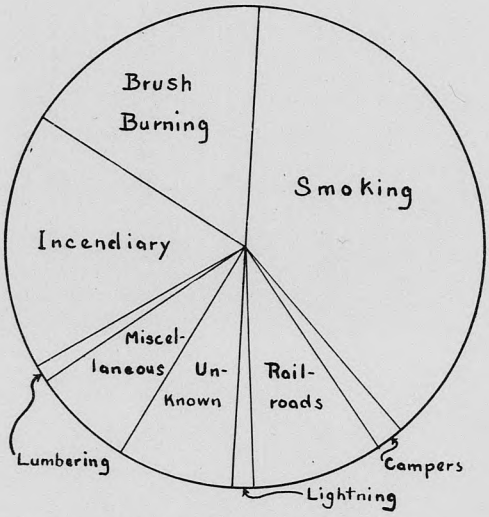


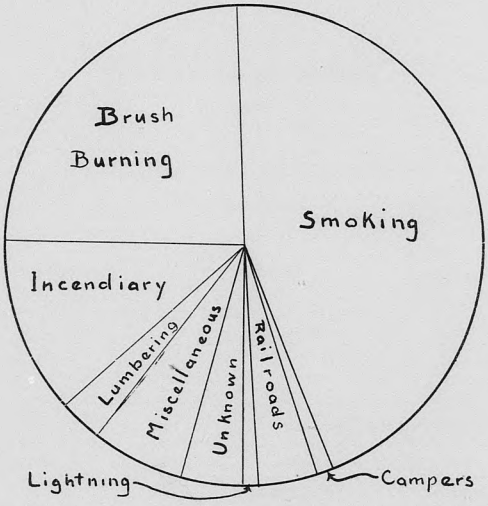
ACREAGE BY CAUSES BURNED BY FOREST FIRES IN 1930.

Total, 102,310 Acres

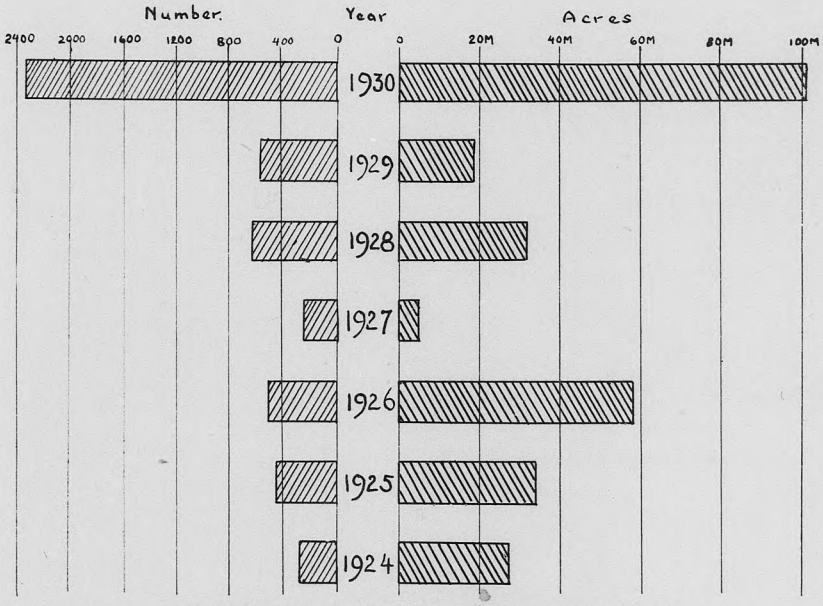


DAMAGE BY CAUSES AS THE RESULT OF FOREST FIRES IN 1930.

Total, $661,011 Damage.



NUMBER OF FOREST FIRES BY CAUSES IN 1930.
Total, 2,313 Forest Fires.



COMPARISON OF ANNUAL FOREST FIRE RECORD

FINANCIAL STATEMENT

1930

Balance, October 1, 1929		$488.94
Receipts (October 1, 1929—September 30, 1930):		
State Treasurer	$68,181.36	
Woodlot work (travel)	186.74	
Reimbursement (fire expenses)	1,534.05	
Other sources	993.83	
Clarke-McNary refund	12,277.63	
	$83,173.61	
Interest	76.93	
		83,250.54
		$83,739.48
Bills paid by State Comptroller		3,258.59
		$86,998.07
Expenditures (October 1, 1929—September 30, 1930):		
Salaries and wages	$46,047.42	
Repairs—Motor vehicles	300.00	
Travel	1,236.09	
Freight and express	100.00	
Postage	815.09	
Office supplies	763.45	
Printing	1,500.00	
Supplies—Motor vehicles	750.00	
Office equipment	441.63	
Field equipment	300.00	
Rent	2,287.56	
Insurance	31.68	
Travel—District Foresters	3,569.49	
Rent—District Foresters	216.00	
Office equipment	200.00	
Office supplies	200.00	
Telephone—District Foresters	120.00	
Telephone—Towers	151.56	
Fire tools	4,446.95	
Travel—Fire patrolmen	2,378.53	
Motor maintenance	1,000.00	
Building repairs	200.00	
Telephone—Patapsco	50.00	
Telephone—Garrett	25.00	
Seeds and trees	875.00	
Telephone—Nursery	40.00	
Miscellaneous	15,492.37	
		83,537.82
Bank balance, September 30, 1930		$3,460.25

APPENDIX

WOODLAND EXAMINATIONS

October 1, 1929—September 30, 1930.

Date 1929		Name	Address	Location	Acres
Oct.	14	Fox, Miss Hannah	c/o W. L. Fox, Phila., Pa.	Near Snow Hill	60
"	23	Mt. Wilson Sanatorium	Mt. Wilson	Mt. Wilson	28
"	25	Schwatt, Mrs. M.	Darlington	Near Darlington	40
Nov.	6	Bradley, J. B.	Federalsburg	3 Miles South of Federalsburg	50
"	6	Brumbaugh, Irving	Greensboro	Near Greensboro	250
"	8	Hutton, Miss Mary A.	Gaithersburg	Near Gaithersburg	130
"	14	Maust, Allan B.	Grantsville	Grantsville	50
"	15	Miller, Jonas B.	Grantsville	1 mile N. E. of Grantsville	45
"	22	Hathaway, A. A.	Easton	Near Easton	56
"	26	Baumgartner, J. Erle	Baltimore	Mt. Washington	15
Dec.	4	Radcliffe, G.	Lloyds	Lloyds	15
"	12	Hawkins, Maj. W. J.	Claiborne	Rich Neck Manor	75
"	12	Thomas, Clyde B.	Gaithersburg	Near Gaithersburg	60
"	13	Radcliffe, Sewell	Lloyds	1 mile west of Lloyds	30
1930					
Jan.	14	Schrider, J. B.	Laytonsville	Near Goshen Church	40
"	14	Leonard, J. Clarence	Trappe	Dividing Creek	38
"	17	Burnett, D.	Riderwood	Near Carney	16
"	20	Corbin, T. Guy	R. F. D. Snow Hill	Near Snow Hill	63
"	22	McConnell, F. H.	Havre de Grace	Havre de Grace	52
Feb.	7	Rinehart, Harry	Westminster	Near Westminster	30
"	21	Radcliffe, Tom	Lloyds	South of Little Choptank River	25
March	7	Bacon, Miss A.	Sparks	Near Belfast	40
"	7	Dickerson, U. W.	Salisbury	Near Salisbury	620
"	11	Baldwin, G. C.	Munsey Bldg., Baltimore	Near Millersville	100
"	13	Rockey, Charles F.	Street	Near Dublin	10
"	13	Keithley, W. C.	Bel Air, R. D.	Near Cresswell	75
"	13	McNabb, D. P.	Whiteford	Near Whiteford	10
"	13	McNabb, D. P.	Whiteford	Near Whiteford	40
"	15	Carroll, Vivian	Cambridge	3 miles N. E. of Church Creek	48
"	25	Wade, George E.	Boonsboro	Below Sharpsville	35
"	25	Coblentz, Maurice	Middletown	Near Middletown	75
"	31	Anderson, Thomas	Rockville	Rockville-Gaithersburg Road	150
"	31	Smith, Mrs. E. J.	Up'r Marlboro	Mellwood	60
April	3	Griffith, U.	Laytonsville	N. E. of Laytonsville	110
May	12	Blaustein, J.	American Bldg., Baltimore	Alto Dale Farm, Reisterst'n Rd.	40
"	14	Holloway, M. Palmer, M. H.	Perryman	Near Aberdeen Proving Grounds	25
"	20	MacGill, Mrs. R.	Simpsonville	Atholton	55
"	27	Bowie, W. B.	Landover	Oak Grove	25
"	28	Henryton Sanatorium	Henryton	Henryton	75
Aug.	18	Andelot Estate, Inc.	Stewart & Donohue, Wilmington, Del.	Worton	400
Sept.	17	Noble, James B.	Cambridge	Near Rhodesdale	35
"	23	Mitchell, Mrs. F. C.	Sparks	Sparks	3

SUMMARY

County	Number	Acres
Anne Arundel	1	100
Baltimore	6	142
Caroline	1	250
Carroll	1	30
Dorchester	6	203
Frederick	1	75
Garrett	2	95
Harford	7	252
Howard	2	130
Kent	1	400
Montgomery	5	490
Prince Georges	2	85
Talbot	3	169
Washington	1	35
Wicomico	1	620
Worcester	2	123
Total number of examinations	42	Total acres 3,199

MARKINGS

October 1, 1929, to September 30, 1930

Date 1929	Name	Address	Location	Acres
Oct. 25	Detrick, Dr. F. L.	Ruxton	Near New Market	50
Nov. 5 and 6	City of Frederick	Frederick	Frederick City Watershed	50
Dec. 17, " 20, " 27, " 30, " 31, 1930 Jan. 1	Hutton, Miss Mary A.	Route 4, Gaithersburg	Near Gaithersburg	130
" 29	Schrider, J. B.	Laytonsville	Near Goshen Church	40
Feb. 20	Radcliffe, G. L.	Lloyds	Near Lloyds	25
March 20	Carroll, Vivian	Cambridge	3 miles N. E. of Church Creeek	48
" 19, " 20, " 27, " 28, April 4, " 4 and 5	Carroll, Mrs. Mary	Ellicott City	Buzzard's Roost, Tridelphia Pike	150
" 5 and 5	Smith, Mrs. E. J.	Up'er Marlboro	Mellwood	60
" 7	Mt. Wilson Sanatorium	Mt. Wilson	Mt. Wilson	60
" 20	MacGill, Mrs. R.	Simpsonville	Atholton	55
June 2, " 3, " 4, " 9, " 10	Anderson, Thomas	Rockville	West of Rockville	150

SUMMARY

County	Number	Acres
Baltimore	1	60
Dorchester	1	48
Frederick	2	100
Howard	2	205
Montgomery	3	320
Prince Georges	1	60
Talbot	2	25
Total number of markings	12	Total Acres 818

ESTIMATES

October 1, 1929, to September 30, 1930

Date 1930	Name	Address	Location	Acres
Jan. 20	Corbin, T. Guy	Snow Hill, R. F. D.	Near Snow Hill	63
Feb. 3	Leonard, J. C.	Trappe	Dividing Creek	38
March 20	Carroll, Vivian	Cambridge	3 Miles E. of Church Creek	48
May 27	Bowie, W. B.	Landover	Oak Grove	25

SUMMARY

County	Number	Acres
Dorchester	1	48
Prince Georges	1	25
Talbot	1	38
Worcester	1	63
Total number of estimates	4	Total Acres 174

PLANTING PLANS

October 1, 1929, to September 30, 1930

Date 1929	Name	Address	Locaton	Acres
Oct. 7	Riley, Miss F. M.	Salisbury	2 miles North of Parsonsburg	38
" 10	Aydelatte, Otho	Girdletree	Near Boxiron	3
" 14	Fox, Miss Hannah	c/o Wm. Fox, Phila., Pa.	Near Snow Hill	40
" 14	Pilchard, Asa	R. D. 5, Pocomoke	Kleg Grange	100
Nov. 22	Stovell, F. D.	Easton	Near Easton	3.8
" 24	Assoc. Gas & Elec. Co.	Oakland	Deep Creek Lake	265
1930				
Jan. 24	Day, R. E., Sr.	Sykesville	Near Sykesville	3
March 7	Curley, Philip C.	Monkton	Near Monkton	25
" 7	Gross, Dr. A. James	Jarrettsville	Bet. Federal Hill and Jarrettsville	3
" 7	Bacon, Miss Anna M.	Sparks	Near Belfast	7
" 11	Fort George C. Meade	Ft. Meade	Fort Meade	..
" 11	Baldwin, C. G.	Baltimore	Near Millersville	3
" 18	Middlekauf, W. E.	Winchester	Winchester	3
" 25	Coblentz, Maurice	Middletown	Near Middletown	10
" 25	Wade, George E.	Boonsboro	Near Sharpsburg	45
April 2	House of Correction	Baltimore	Jessup	..
July 7	Cumberland Country Cl.	Cumberland	Evitt's Creek	..
Sept. 19	Noble, James B.	Cambridge	Near Rhodesdale	5

SUMMARY

County	Number	Acres
Allegany	1	..
Anne Arundel	4	6
Baltimore	2	32
Dorchester	1	5
Frederick	1	10
Garrett	1	265
Harford	1	3
Howard	1	3
Talbot	1	3.8
Washington	1	45
Wicomico	1	38
Worcester	3	143
Total number of planting plans	18	Total Acres 553.8

LECTURES

October 1, 1929, to December 31, 1930

*Illustrated. †Extension Department.

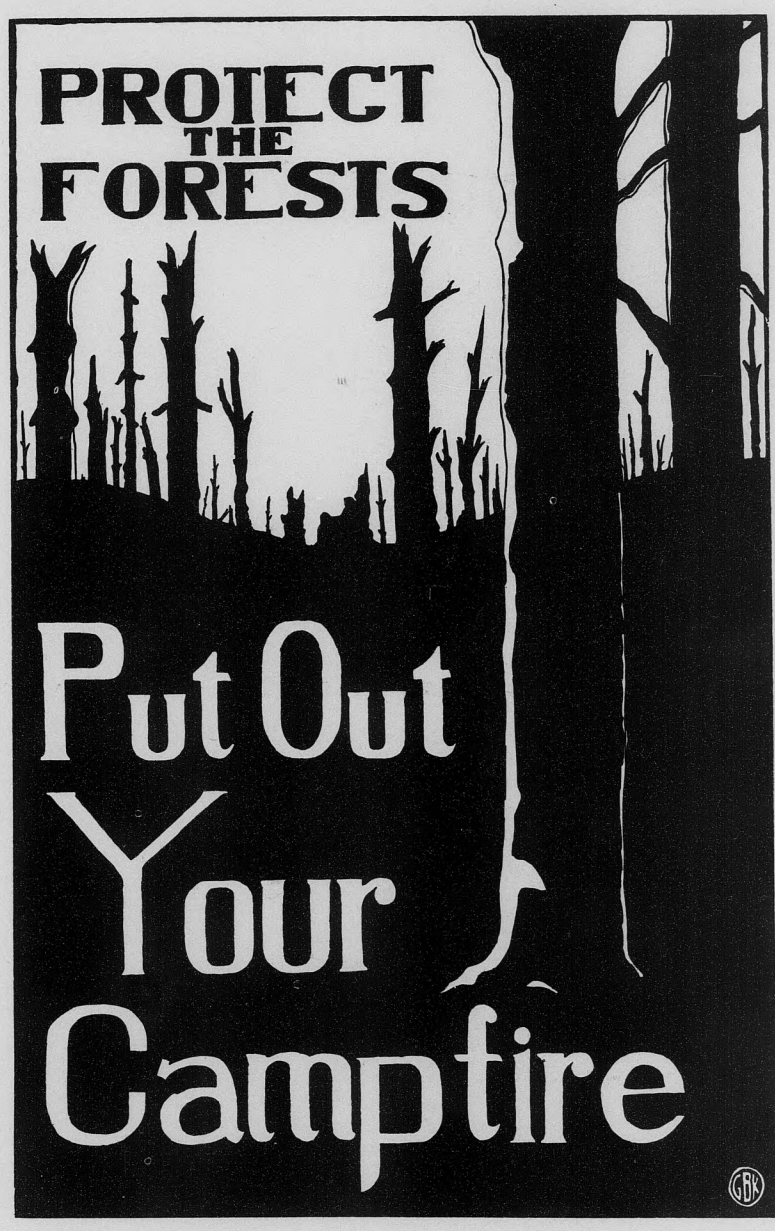
Date	Location	Under Auspices
1929		
Oct. 1	Rohrer School	School
" 2	Piney Ridge School	School
" 3	Baltimore	*Alexander Hamilton School
" 10	Rossville	*Rossville School Parent-Teacher Association
" 16	Ellicott City	*Ellicott City Volunteer Fire Department
" 23	Baltimore	Intermediate Supervisors, Baltimore Schools
Nov. 6	Ryons Glade	†*Extension Service
" 7	Bittinger	†*Extension Service
" 8	Grantsville	†*Extension Service
" 19	Highland	†Highland Community Fair
" 19	Elkton	*Woman's Club of Elkton
Dec. 6	Salisbury	*Boy Scouts
" 11	St. Michaels	St. Michaels Woman's Club
" 12	Upper Marlboro	Marlboro Volunteer Fire Department
" 12	Baltimore	Baltimore City College
" 13	James	Community Club of Neck District
1930		
Jan. 7	Galesville	Galesville Volunteer Fire Department
" 14	Hunting Ridge, Balto.	*Parent-Teacher Asso., Hunting Ridge School
" 14	Germantown	*Parent-Teacher Asso., Germantown School
" 14	Yellow Springs	*Department of Forestry
" 15	Zeigler's Church	*Department of Forestry
" 16	Forest School	*Department of Forestry
" 17	Mountaindale	*Department of Forestry
" 20	Cumberland	*Allegany Fish & Game Association
" 22	Greater Capitol Heights	Greater Capitol Heights Volunteer Fire Dept.
" 22	Baltimore	Federated Garden Clubs
" 22	Frederick	Izaak Walton League
" 23	Baltimore	*Pine Tree Club
" 28	Easton	*Easton Civic League
" 28	New Germany	*Forest Warden
" 29	Back Woods	*Forest Warden
" 30	Bond	*Forest Warden
" 31	Dry Run	*Forest Warden
Feb. 1	Swallow Falls	*Forest Warden
" 3	Bittinger	*Forest Warden

LECTURES—Continued

Date 1930		Location	Under Auspices
Feb.	3	Silver Spring	*Silver Spring Volunteer Fire Department
"	4	Hyattstown	Hyattstown Volunteer Fire Department
"	5	Wolfe Swamp	*Forest Warden
"	6	Jennings	*Forest Warden
"	7	Cambridge	*Forest Wardens' Conference
"	7	Cambridge	Cambridge Rotary Club
"	10	Kensington	*Kensington Volunteer Fire Department
"	10	Laytonsville	†*Extension Service
"	11	Salisbury	*Farm Bureau
"	11	Frederick	*Forest Wardens' Conference
"	11	Oxon Hill	†*Parent-Teacher Association, Oxon Hill School
"	11	Linthicum Heights	*Linthicum Heights Improvement Association
"	12	Cumberland	*Forest Wardens' Conference
"	12	Damascus	†*Extension Service
"	13	Gaithersburg	*Gaithersburg Volunteer Fire Department
"	13	Mitchellville	†*Extension Service
"	15	Salisbury	*Salisbury Grange
"	17	Ridgely	*Ridgely Community Club
"	18	Baltimore	Women's Alliance
"	25	La Plata	*Forest Wardens' Conference
"	26	College Park	*Forest Wardens' Conference
"	26	Rockville	Rockville Volunteer Fire Department
March	4	Upper Marlboro	Mellwood Woman's Club
"	4	Elkton	*Forest Wardens' Conference
"	4	Trego	*Forest Warden
"	4	Pimlico, Baltimore	*School 223
"	5	Mt. Briar	*Forest Warden
"	6	Foxville	*Foxville School
"	6	Baltimore	*Gwynns Falls Junior High School
"	7	Catoctin Furnace	*Forest Warden
"	9	Baltimore	*Dr. M. L. Ingram
"	11	Frederick	*Hood College
"	11	Millersville	*Parent-Teacher Asso., Consolidated School
"	12	Ridge	Ridge School
"	12	Beachville	Beachville School
"	12	St. Jerome	St. Jerome School
"	12	Great Mills	High School
"	12	Pearson	*Community
"	14	Cumberland	Boy Scouts
"	14	Oakley	*Community
"	17	Pocomoke	†Pocomoke Rotary Club
"	18	South Cumberland	South Cumberland Rod & Gun Club
"	18	Cambridge	*Cambridge Woman's Club
"	19	Sandy Spring	Sandy Spring Volunteer Fire Department
"	19	Sandy Spring	*Department of Forestry
"	19	Cumberland	Boy Scouts
"	20	South Cumberland	Boy Scouts
"	20	Baltimore	*Maryland Chapter, D. A. R.
"	21	Baltimore	*Parent-Teacher Association, School No. 37
"	24	Hyattsville	Hyattsville Volunteer Fire Department
"	26	Halethorpe	*Halethorpe Community Association
"	31	Kitzmiller	Kitzmiller Civic Club
April	1	Oakland	Oakland Civic Club
"	3	Perry Point	U. S. Veterans Hospital
"	3	Rockville	†Rockville Rotary Club
"	8	Sunnybrook	*Parent-Teacher Association Sunnybrook School
"	9	West Annapolis	*West Annapolis Improvement Association

LECTURES—Continued

Date 1930	Location	Under Auspices
April 10	Stemmers Run	*Zion Young Peoples League
" 11	Towson	*State Normal School
" 11	Baltimore	*Forest Park High School
" 14	Jarrettsville	*Parent-Teacher Asso., Jarrettsville School
" 17	Kitzmiller	Kitzmiller High School
" 17	Kitzmiller	Kitzmiller Grammar School
" 21	Cumberland	*Girl Scouts
" 21	Baltimore	*Florence Nightingale Junior High School
" 28	Frederick	†*Frederick Chapter, D. A. R.
" 28	Frederick	†*Agricultural Class, Frederick High School
" 28	Walkersville	†*Parent-Teacher Asso., Walkersville School
" 30	Oakland	†*Jr. Agricultural Class, Oakland High Schooi
" 30	Oakland	†*Sr. Agricultural Class, Oakland High School
May 6	College Park	Engineering Class in Materials
" 8	Baltimore	*Appold M. E. Brotherhood
" 12	College Park	†*Students Grange
" 20	Salisbury	*State Normal School
" 23	Baltimore	*Luther Brotherhood
" 27	Cottage City	*Cottage City School
" 28	Trap Run	Trap Run School
" 31	Frostburg	Boy Scouts
June 7	Camp Linstead	Boy Scouts
" 7	Camp Linstead	*Boy Scouts
" 12	Laurel	*Men's Club, St. Philip's Church
" 25	Catonsville	Catonsville Rotary Club
Aug. 30	Mt. Lake Park	Regional Planning Conference
Sept. 2	Wash., D. C. (Radio)	†Extension Service
" 4	College Park	State Fireman's School
" 26	Hamilton, Baltimore	Northeast District, Boy Scouts



PRIZE POSTER DESIGN, BOY SCOUT CONTEST.